July 2004

Project-X1-Monthly Software Status Report

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1.0 Project-X1 Software Development Progress Assessment

1.1 PROJECT-X1 Flight Software Development Status

The PROJECT-X1 project concluded the S/C System Definition Review (SDR) in July 2004. The purpose of the SDR was to ensure the system and segment requirements were completely identified, viable, traceable, and understood by the customer and developer organizations. The SDR effort resulted in major updates to the system specification requirement documents. The updates included requirement changes, the addition of rationale for each requirement or group of requirements, and the addition of links between "parent" and "child" requirements.

The PROJECT-X1 project delayed the S/C Preliminary Design Review (PDR) from December 2004 to mid March 2005. The delay is required to prepare the documentation to enhance the probability of a successful PDR.

1.2 Planned PROJECT-X1 Software Development Milestones

The following near term PROJECT-X1 software development milestones are expected:

- S/C GN&C Design Requirements Document (DRD) v 3.0 – August, 2004
- S/C Software Technical Interchange Meeting (TIM) – September, 2004
- S/C Preliminary Design Review (PDR) – March, 2005
- S/C S1 Software System Definition Review (SDR) – April, 2005

2.0 Risk Assessment

The IV&V team is currently tracking one risks; the description, current status, and IV&V recommendation follows:
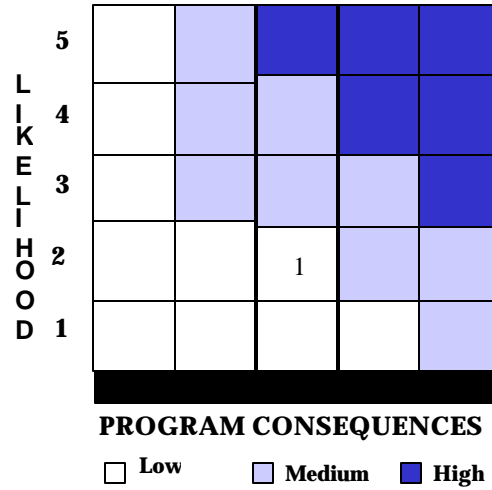
1. Inadequate Software Development Process

Description: The PROJECT-X1 software development process as documented in the Software Development Plan (SDP) is inadequate and presents a risk to mission success, cost and schedule performance for both the S/C1 and S1. Some of the deficiencies include insufficient detail, inadequate process description, and incomplete software development life cycle planning.

Status: The Software Development Plan (SDP) has undergone a number of reviews and revisions to eliminate deficiencies. The last revision addressed the Computer Software Configuration Items (CSCIs) integration plans. This has eliminated the risk for the S1 segment. For the S/C1 segment, the PROJECT-X1 project has conducted a limited software hazards analysis and has identified several potential software hazards. The project is developing plans for a follow-on assessment to increase the analysis scope and depth. The analysis should provide sufficient background for the design of testing to mitigate the risk. The testing is to be performed as part of the S/C Final Qualification Testing (FQT) scheduled to start in May 2005.

Recommendation: The project should seek to mitigate this risk for the S/C1 segment through software testing. Specifically, the project should execute integrated software tests designed to ensure the software will not present a hazard during flight.

PROJECT-X1 IV&V Risk Summary Matrix

PROGRAM CONSEQUENCES

☐ **Low**   ☐ **Medium**   ■ **High**

⬇ **Worsened**

⬆ **Improved**

⬌ **Unchanged**

✚ **New Since Last Status**

#	Title	Likelihood	Consequence	Magnitude	Trend
1	Inadequate Software Development Plan (S/C1)	2	3	6	⬌
2					
3					
4					
5					

Significant IV&V PROJECT-X1 Activities and Contributions:

Title: PROJECT-X1 S/C1 System Definition Review (SDR)

IV&V Activity: The IV&V team concluded the review of the PROJECT-X1 S/C1 Vehicle, System, and Ground Specifications in support of the S/C1 System Definition Review (SDR). This activity has resulted in major updates to the vehicle, system, and ground specifications. The IV&V team collected a total of 110 issues against the specifications. Of these, two were classified as high severity. These included missing load limit requirements for the critical second flight phase and missing requirements for the emergency abort functionality.

IV&V Recommendations: Complete review of IV&V findings with NASA and Developers. Document the IV&V SRR and SDR findings.

Project Response: The IV&V issues generated in support of the SDR have been well received by Project and Developer PROJECT-X1 review teams.

Project Impact: IV&V generated issues have contributing to the establishment of system and vehicle level requirements for the S/C1 segment.

Title: PROJECT-X1 FY 2005 IV&V Task Review

IV&V Activity: The IV&V team met with the Project/Houston in late June to review the PROJECT-X1 IV&V tasks scheduled for the first half of FY 2005. At the meeting, an agreement was reached on modifications to a prioritized list of tasks to be performed.

IV&V Recommendations: IV&V will adjust scheduled tasks to accommodate requested changes.

Project Response: The PROJECT-X1 project agreed to the IV&V task priorities and requested a few changes.

Project Impact: The IV&V task adjustments will better align the IV&V effort to the project's goals.